大葉大學 95 學年度 研究所碩士班 招生考試試題紙

系所別	組別	考試科目（中文名稱）	考試日期	節次	備註
事業經營研究所	甲乙	統計學	4月23日	第三節	不可攜帶計算機

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶） 13:30～15:00 P2-1

註：解到計算步驟者則一概不計分.

1. The Graduate Management Admission Test (GMAT) is requirement for all applicants of MBA programs. There are a variety of preparatory courses designed to help improve GMAT scores, which range from 200 to 800. Suppose that a survey of MBA students reveals that among GMAT scores above 650, 52% took a preparatory course, whereas among GMAT scores of less than 650, only 23% took a preparatory course. An applicant to an MBA program has determined that he needs a score of more than 650 to get into a certain program, but he feels that his probability of getting that high a score is quite low---10%. He is considering taking a preparatory course that cost $500. He is willing to do so only if his probability of achieving 650 or more doubles.
   a. What is the prior probability of scoring 650 or more than on the GMAT? (5%)
   b. Find the marginal probability of take a preparatory course. (5%)
   c. What is his decision? Explain why? (10%)
   d. If he does not take the preparatory course, what is the probability of scoring 650 or more than on the GMAT? (10%)
2. Lumber companies need to be able to estimate the amount of lumber that they can harvest in a tract of land to determine whether the effort will be profitable. To do so, they must estimate the mean diameter of the trees. It has been decided to estimate that parameter to within 1 inch with 95% confidence. A forester familiar with the territory guesses that the diameters of the trees are normally distributed with a standard deviation of 6 inches. How large a sample should be taken? (hint: $z_{0.025}=1.96$) (10%)
3. The following table represents increases in GMAT scores for students using a computer-based tutorial.

Increase in Score (X)	Number
$X \leqq 20$	20
$20 < X \leqq 30$	60
$30 < X \leqq 40$	100
$40 < X \leqq 50$	90
$50 < X \leqq 60$	80
$60 < X$	50

   Can we conclude that the data come from a normal distribution with $\mu = 40$ and $\sigma = 10$? (α=0.05) (hint: $\chi_{0.05,5}=11.0705$) (15%)
4. Given are data for two variables, x_i and y_i.

x_i	1	2	3	4	5
y_i	3	7	5	11	14

   a. Use the least squares method to develop an estimated regression equation. (10%)
   b. Compute the coefficient of determination r^2. Comment on the goodness of fit. (10%)
   c. Test for a significant relationship using the F test. Use α=0.05. Please show the ANOVA table. (hint: $F_{1,3,0.05}$=10.13) (10%)
5. Suppose that the diameter of the piston rings is actually a random variable that is normally distributed with a mean of 0.826 mm and a standard deviation of 0.003 mm.
   d. If we allow for some variation, called the tolerance. Compute the probability that the diameters of the piston rings with a tolerance of 0.006 mm. (7%)
   e. If we can decrease the standard deviation from 0.003 mm to 0.002mm. Compute the probability that the diameters of the piston rings with a tolerance of 0.006 mm. (8%)

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事業經營研究所	甲、乙	統計學	4月23日	第三節	僅用可攜帶不可程式之計算機

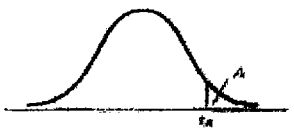
註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

P2-2

Table 3 Normal Probabilities

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Table 4 Critical Values of t



DEGREES OF FREEDOM	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$	DEGREES OF FREEDOM	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657	24	1.318	1.711	2.064	2.492	2.797
2	1.886	2.920	4.303	6.965	9.925	25	1.316	1.708	2.060	2.485	2.787
3	1.638	2.353	3.182	4.541	5.841	26	1.315	1.706	2.056	2.479	2.779
4	1.533	2.132	2.776	3.747	4.604	27	1.314	1.703	2.052	2.473	2.771
5	1.476	2.015	2.571	3.365	4.032	28	1.313	1.701	2.048	2.467	2.763
6	1.440	1.943	2.447	3.143	3.707	29	1.311	1.699	2.045	2.462	2.756
7	1.415	1.895	2.365	2.998	3.499	30	1.310	1.697	2.042	2.457	2.750
8	1.397	1.860	2.306	2.896	3.355	35	1.306	1.690	2.030	2.438	2.724
9	1.383	1.833	2.262	2.821	3.250	40	1.303	1.684	2.021	2.423	2.705
10	1.372	1.812	2.228	2.764	3.169	45	1.301	1.679	2.014	2.412	2.690
11	1.363	1.796	2.201	2.718	3.106	50	1.299	1.676	2.009	2.403	2.678
12	1.356	1.782	2.179	2.681	3.055	60	1.296	1.671	2.000	2.390	2.660
13	1.350	1.771	2.160	2.650	3.012	70	1.294	1.667	1.994	2.381	2.648
14	1.345	1.761	2.145	2.624	2.977	80	1.292	1.664	1.990	2.374	2.639
15	1.341	1.753	2.131	2.602	2.947	90	1.291	1.662	1.987	2.369	2.632
16	1.337	1.746	2.120	2.583	2.921	100	1.290	1.660	1.984	2.364	2.626
17	1.333	1.740	2.110	2.567	2.898	120	1.289	1.658	1.980	2.358	2.617
18	1.330	1.734	2.101	2.552	2.878	140	1.288	1.656	1.977	2.353	2.611
19	1.328	1.729	2.093	2.539	2.861	160	1.287	1.654	1.975	2.350	2.607
20	1.325	1.725	2.086	2.528	2.845	180	1.286	1.653	1.973	2.347	2.603
21	1.323	1.721	2.080	2.518	2.831	200	1.286	1.653	1.972	2.345	2.601
22	1.321	1.717	2.074	2.508	2.819	∞	1.282	1.645	1.960	2.326	2.576
23	1.319	1.714	2.069	2.500	2.807						